41

$2817
CC

Attorney Docket: 2671.00015

IN RE APPLICATION OF: Varalakshmi Basawapatna et al.

RESPONSE TRANSMITTAL AND EXTENSION OF TIME REQUEST (IF REQUIRED)

SERIAL NO.: 09/997,468

TITLE: FERRITE CRYSTAL RESONATOR COUPLING STRUCTURE

FILED: November 29, 2001

EXAMINER: Takaoka, D.

ART UNIT: 2817

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed please find an amendment, change of correspondence address with attachments and a postcard along with the fee calculation below:

FEE CALCULATION FOR ENCLOSED AND EXTENSION REQUEST (IF ANY)

	Claims Remaining	Highest No. Previous	Extra Rate	Additional Fee
Total Claims	20 minus	20 =	0 x $ 18.00	$ 0.00
Independent Claims	5 minus	3 =	2 x $ 84.00	$168.00
Multiple Dependent Claim First Added			+ $280.00	$ 0.00

TOTAL IF NOT SMALL ENTITY $168.00

[ ] SMALL ENTITY STATUS - If applicable, divide by 2 ..... $0.00
[ ] Verified statement enclosed, if not previously filed.

[ ] Applicant also requests a ____ month extension of time for response to the outstanding Office Action. The fee is $0.00

[ ] Fee set forth in 37 C.F.R. 1.17 (p) for Information Disclosure under 37 C.F.R. 1.97 (c) $0.00

TOTAL FEE $168.00

The Commissioner is hereby authorized to charge any overpayment or underpayment of the above fee associated with this Communication to Deposit Account No. 50-0541. A duplicate copy of this sheet is attached.

CHRISTOPHER P. MAIORANA, P.C.

By: _____
Christopher P. Maiorana
Registration No.: 42,829

24025 Greater Mack, Suite 200
St. Clair Shores, Michigan 48080
(586) 498-0670

I hereby certify that this letter, the response or amendment attached hereto are being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22131-1450, on September 15, 2003.

By: Mary Donna Berkley
Mary Donna Berkley

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Varalakshmi Basawapatna et al.
Serial No.:	09/997,468
Title:	FERRITE CRYSTAL RESONATOR COUPLING STRUCTURE
Filed:	November 29, 2001
Attorney Docket No.:	2671.00015
Examiner:	Takaoka, D.
Art Unit:	2817
In Response To:	Office Action mailed June 19, 2003

I hereby certify that this letter, the response or amendment attached hereto are being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on September 15, 2003 .

By: Mary Donna Berkley
Mary Donna Berkley

AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action mailed June 19, 2003 please amend the above-identified application as follows:

AMENDMENTS TO THE CLAIMS

(IN REVISED FORMAT COMPLIANT WITH THE PROPOSED REVISION TO 37 CFR 1.121)

Please cancel claims 3 and 20 without prejudice.

1. (CURRENTLY AMENDED) A ferrite crystal resonator coupling structure comprising:

a circuit substrate having a first side, a second side opposite the first side, and an aperture extending through the circuit substrate between a first opening of the aperture on the first side of the circuit substrate to a second opening of the aperture on the second side of the circuit substrate, wherein the aperture is configured to permit rotation of a ferrite crystal disposable at least partially therein; ~~and~~

a coupling member extending between a first end and a second end of the first opening of the aperture across at least a portion of the first opening of the aperture, such that an electric current is directable through the coupling member; and

a coupling substrate on the first side of the circuit substrate, wherein (i) the coupling substrate includes a first side facing the first side of the circuit substrate and (ii) the coupling substrate is in registration with the coupling member.

2. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim 1, wherein the ferrite crystal is rotateable about a plurality of axes whereby a desirable axis of the ferrite crystal is alignable in relation to a magnetic field within the aperture.

3. (CANCEL)

4. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim ~~3~~ 1, wherein the coupling member is etched into the coupling substrate.

5. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim ~~3~~ 1, wherein the coupling substrate is configured to restrict movement of the ferrite crystal within the aperture toward the first opening of the aperture.

6. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim ~~3~~ 1, wherein (i) the coupling substrate includes a hole in the first side thereof for receiving a portion of the ferrite crystal, and ~~wherein~~ (ii) the hole is aligned with the first opening of the aperture and smaller in cross-sectional area than the first opening.

7. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim 1, wherein the aperture is configured to restrict movement of the ferrite crystal within the aperture toward the first opening of the aperture.

8. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim 1, further comprising:

a structure for applying a force to effect rotation of the ferrite crystal about an axis of rotation of the ferrite crystal.

9. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim 8, wherein the structure for applying a force to effect rotation of the ferrite crystal comprises:

a rotateable element having a first surface that can come in contact with the ferrite crystal, wherein the rotateable element is rotateable to apply a frictional rolling force to the surface of the ferrite crystal.

10. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim 9, further comprising:

a drive shaft for applying a rotational force to the rotateable element, wherein the drive shaft is coupleable with a motor.

11. (CURRENTLY AMENDED) The ferrite crystal resonator coupling structure of claim 9, wherein the first surface of the rotateable element is configured to initiate shifting of the ferrite crystal to a different axis of rotation of the ferrite crystal.

12. (ORIGINAL) A multiple ferrite crystal resonator coupling structure comprising:

a first circuit substrate having a first side, a second side opposite the first side, and a first aperture extending through the first circuit substrate between a first opening of the first aperture on the first side of the first circuit substrate to a second opening of the first aperture on the second side of the first circuit substrate, wherein the first aperture is configured to permit rotation of a first ferrite crystal disposable at least partially therein about a plurality of axes such that a desirable axis of the first ferrite crystal is alignable in relation to a first magnetic field within the first aperture;

a second circuit substrate having a first side, a second side opposite the first side, and a second aperture extending through the second circuit substrate between a first opening of the second aperture on the first side of the second circuit substrate to a second opening of the second aperture on the second side of

the second circuit substrate, wherein the second aperture is configured to permit rotation of a second ferrite crystal disposable at least partially therein about a plurality of axes such that a desirable axis of the second ferrite crystal is alignable in relation to a second magnetic field within the second aperture;

a first coupling member extending between a first end and a second end of the first opening of the aperture across at least a portion of the first opening of the first aperture, wherein a first electric current can be directed through the first coupling member; and

a second coupling member extending between a first end and a second end thereof across at least a portion of the first opening of the second aperture, wherein a second electric current is can be directed through the second coupling member.

13. (CURRENTLY AMENDED) The multiple ferrite crystal resonator coupling structure of claim 12, further comprising an enclosure, the first and second circuit substrates being disposed within the enclosure.

14. (CURRENTLY AMENDED) The multiple ferrite crystal resonator coupling structure of claim 13, wherein the enclosure includes a magnetic dam disposed between the first and second

circuit substrates for minimizing coupling between the first and second ferrite crystals.

15. (CURRENTLY AMENDED) A computer controlled automatic alignment system operable to effect rotation of a ferrite crystal within a ferrite crystal resonator coupling structure in a controlled incremental fashion until a desirable axis of the ferrite crystal is aligned in relation to a magnetic field, the automatic alignment system comprising:

a control computer;

a motor controller coupled to the control computer;

a motor coupled to the motor controller, the motor operable to generate a force for rotating the ferrite crystal;

a main coil sweep unit coupled to the control computer, the main coil sweep unit operable to supply a variable electrical current to the ferrite crystal resonator coupling structure; ~~and~~

output instrumentation coupled to the control computer, the output instrumentation adapted to measure characteristics of the output of the ferrite crystal resonator structure and to provide the measurements to the control computer; and

a heat source (i) coupled to the control computer and (ii) operable to heat the ferrite crystal in the ferrite crystal resonator coupling structure when instructed to by the control computer.

16. (ORIGINAL) The automatic alignment system of claim 15 wherein the output instrumentation comprises:

a scalar network analyzer coupled to the control computer, the scalar network analyzer adapted to interface with the ferrite crystal resonator coupling structure and communicate any information collected by the scalar network analyzer to the control computer.

17. (ORIGINAL) The automatic alignment system of claim 15 wherein the output instrumentation comprises:

a frequency counter coupled to the control computer, the frequency counter adapted to interface with the ferrite crystal resonator coupling structure and communicate any information collected by the frequency counter to the control computer.

18. (ORIGINAL) The automatic alignment system of claim 15 wherein the output instrumentation comprises:

a spectrum analyzer coupled to the control computer, the spectrum analyzer adapted to interface with the ferrite crystal resonator coupling structure and communicate any information collected by the spectrum analyzer to the control computer.

19. (ORIGINAL) The automatic alignment system of claim 15 wherein the output instrumentation comprises:

a power meter coupled to the control computer, the power meter adapted to interface with the ferrite crystal resonator coupling structure and communicate any information collected by the power meter to the control computer.

20. (CANCEL)

21. (RE-PRESENTED - FORMERLY DEPENDENT CLAIM 7) A ferrite crystal resonator coupling structure comprising:

a circuit substrate having a first side, a second side opposite the first side, and an aperture extending through the circuit substrate between a first opening of the aperture on the first side of the circuit substrate to a second opening of the aperture on the second side of the circuit substrate, wherein the aperture is configured to permit rotation of a ferrite crystal disposable at least partially therein; and

a coupling member extending between a first end and a second end of the first opening of the aperture across at least a portion of the first opening of the aperture, such that an electric current is directable through the coupling member, wherein the aperture is configured to restrict movement of the ferrite crystal within the aperture toward the first opening of the aperture.

22. (RE-PRESENTED - FORMERLY DEPENDENT CLAIM 9) A ferrite crystal resonator coupling structure comprising:

a circuit substrate having a first side, a second side opposite the first side, and an aperture extending through the circuit substrate between a first opening of the aperture on the first side of the circuit substrate to a second opening of the aperture on the second side of the circuit substrate, wherein the aperture is configured to permit rotation of a ferrite crystal disposable at least partially therein;

a coupling member extending between a first end and a second end of the first opening of the aperture across at least a portion of the first opening of the aperture, such that an electric current is directable through the coupling member; and

a structure for applying a force to effect rotation of the ferrite crystal about an axis of rotation of the ferrite crystal, said structure comprising a rotateable element having a first surface that can come in contact with the ferrite crystal, wherein the rotateable element is rotateable to apply a frictional rolling force to the surface of the ferrite crystal.